Report Addendum to

Phase II Environmental Site Assessment
"Town Parcel"
Port of Cape Charles
Sustainable Technologies Industrial Park
Cape Charles, Virginia

Prepared for:

Northampton County Office of
Sustainable Development
16422B Courthouse Road
P.O. Box 1407
Eastville, VA 23347

Prepared by:

804 Moorefield Park Drive, Suite 302
Richmond, VA 23236
804-560-7600 ◊ fax 804-560-5129

January 10, 2002

Chandler Smith
PBS&J
Project Manager

1/10/02
Date

Dennis Papa, P.G.
PBS&J
Program Manager

1/10/02
Date

Pat G. Smith

1/11/02
Date

Northampton County Office of Sustainable Development
US EPA Showcase Community Coordinator

PBS&J

An employee-owned company

January 10, 2002

Pat G. Smith
Showcase Community Coordinator
Northampton County Office of Sustainable Development
16422B Courthouse Road
P.O. Box 1407
Eastville, VA 23347

RE: Final Report Addendum to Phase II ESA of Town Parcel, Port of Cape Charles Sustainable Technologies Industrial Park Brownfield Project

Dear Ms. Smith:

PBS&J is pleased to submit three copies of the above referenced report. The report details the procedures and results of the final phase of environmental site assessment activities at the former Port of Cape Charles Sustainable Technologies Industrial Park (STIP) Town Dump area. The activities included a landfill gas study, additional soil sampling, and removal of asbestos material.

Please call me at 804-560-7600 with any questions or if you need more information.

Sincerely,

PBS&J

Dennis Papa, P.G.
Program Manager

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

1.0 INTRODUCTION

This Report provides an addendum to PBS&J's Phase II Environmental Site Assessment (ESA) activities conducted on a portion of the Sustainable Technologies Industrial Park (STIP) in Cape Charles, Virginia.

This addendum describes procedures and results of additional site assessment activities that were performed to supplement and complete our final Phase II ESA report ("Phase II Environmental Site Assessment of Town Parcel, Port of Cape Charles Sustainable Technologies Industrial Park, Cape Charles, VA", dated March 31, 1999). The scope of these additional activities was largely determined by US EPA Region III and the Agency for Toxic Substances and Disease Registry (ATSDR) following a review of the final Phase II report. This review was documented in a Health Consultation memo submitted January 26, 2000 (copy attached as Appendix C). The following additional activities were performed:

- Identify the presence or absence of subsurface and above surface landfill gas at the property through installation and sampling of eight landfill gas probes.

- Conduct additional sediment sampling in the vicinity of sediment sample SS-1 to better determine the extent of pesticide, hydrocarbons, and metals contamination detected at this sample location during the Phase II ESA.

- Remove and properly dispose of non-friable asbestos containing shingle material identified in the landfill at Test Pit location TP-16.

Background information for the project area, such as a site description, and details of the previous Phase II investigations, is discussed in Section 2.0 of this report. Section 3.0 describes the procedures and results of the additional site assessment activities. Section 4.0 provides a summary of activities and conclusions.

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS

2.1 Site Description

The Cape Charles Sustainable Technologies Industrial Park (STIP) is located in the Cape Charles Harbor area, which has been active since about 1885 and once accommodated a thriving port and rail yard. In addition to the dockside and rail yard, the STIP area currently contains a former municipal landfill that began operation prior to 1949, and the remains of abandoned industrial and commercial operations. The landfill was closed and stopped accepting waste in 1995, and became the focus of the Phase II investigation.

The study area is bordered to the east by State Route 642 and "the Robberecht property", which includes a former grade school building that later housed a seafood processing operation. Areas of trees and farmland lie to the east beyond State Route 642. Trees and farm fields are also located south of the study area. State Route 1108 marks the northern edge of the majority of the study area. The southern portion of Parcel A includes the closed landfill that is approximately five acres in size. Areas of tree growth cover and surround the landfill area.

The Town of Cape Charles WWTP separates the study area into southeastern and northwestern sections. State Route 1108 and a spur of the Eastern Shore Railroad mark the southeastern boundary of the northwestern section. The Zapata property, formerly the site of Eastern Shore Grainery, lies to the west of the northwestern section.

The U.S. Geological Survey topographic map that includes the Town Parcel project site and vicinity is the Cape Charles, Virginia 7.5 minute series quadrangle. A partial copy of the map is included as Figure 1 in Appendix A. The map shows topography at the site to be generally flat, at an elevation of approximately 10 feet above mean sea level (MSL). Several mounds of soil/debris have been created in the vicinity of the closed municipal landfill. The project site is covered by several acres of wetlands.

Nearby surface water bodies include the Chesapeake Bay, located several hundred yards to the west of the site. Cape Charles Harbor borders part of the property to the west. A small unnamed creek begins near the boundary with the Robberecht property and traverses west-northwest across Parcel A. The creek is channeled under State Route 1108 and into Cape Charles Harbor near the former Cape Charles Seafood facility. A wastewater effluent polishing pond is situated on Parcel A, adjacent to the WWTP. A pond and an area of wetlands are situated approximately 80 feet to the east of the polishing pond. Overall surface and groundwater flow is to the west, toward Cape Charles Harbor and the Chesapeake Bay.

The hydrogeologic system on Virginia's Eastern Shore consists of a framework of aquifers and confining units. The hydrogeology and ground-water-flow system of the Eastern Shore peninsula are discussed in detail in published literature (Fennema and Newton, 1982; Meng & Harsh, 1988; Richardson, 1992); a summary is provided below.

Four primary fresh water aquifers exist beneath the study area. The uppermost aquifer is the Columbia aquifer, or water table aquifer. The Columbia consists of the saturated, sandy, surficial sediments up to approximately 60 feet below ground surface (bgs). Depth to the aquifer varies with topography, being closest to the surface at topographic lows. Beneath the Columbia is a continuous clay and silt layer (aquitard) that separates the Columbia aquifer from the primary potable aquifer on the Eastern Shore, the Upper Yorktown-Eastover aquifer. Although the Columbia is used for domestic and agricultural purposes, and the quality is generally within drinking standards, inconsistent quality related to salt water, septic systems, fertilizer and pesticide use, and petroleum and other chemical storage preclude the Columbia from use as a large ground water producer in many parts of the Eastern Shore. Recharge to the aquifer system occurs almost exclusively through precipitation falling on the Eastern Shore and infiltrating through the sediment.

Soils of the Eastern Shore are predominantly made up of sand, silt and shell fragments. The dominant constituent is sand, which contains varying amounts of finer

particles ranging in size from very fine sand to clay. This range and combination of soil types comprise the six soil associations found on the Eastern Shore. In general, soils are moderately well drained, except in certain sections of the foreland along the Bay associated with Accomack County and along the oceanside of Northampton County.

The subject property is located on the seaward edge of the Atlantic Coastal Plain Physiographic Province. Coastal plain sediments consist of Lower Cretaceous to Holocene-aged deposits of gravel, sand, silt and clay. The geologic unit underlying the Town Parcel is the Occohannock Member of the Nassawadox Formation (upper Pleistocene). The unit is described as a light yellowish grey, fine to medium sand. Stratigraphy directly beneath the site consists of silt overlying fine sand. The generalized geologic profile observed from soil borings at the landfill site is summarized as follows:

- 0 - 5 ft. - moist, light brown, sandy and clayey silt. Broken glass, rock, concrete and asphalt fragments, wood, plastic, metal, cloth and other debris mixed with soil present at the surface

- 5 ft. - 16 ft. - moist to saturated, light brown, grey and orange, silty fine sand. A layer of glass, rock, concrete and asphalt fragments, wood, plastic, metal, cloth and other debris mixed with soil is also present from 4 to 13 feet in portions of the closed landfill area.

Geologic cross-sections were prepared from soil boring logs and test pit excavation information. The locations of cross-sections A - A' are depicted on Figure 4. As shown in the cross-sections, a layer of "buried debris" up to 10 feet thick was identified in the area of the former landfill. The debris is compacted, with a minimum of void spaces detected, and is in contact with the shallow groundwater table.

Depth to ground water in monitoring wells installed onsite was measured on several occasions during the Phase II ESA. Depth to groundwater consistently ranged from approximately 7 to 10 feet below ground surface, or 2 to 5 feet above mean sea level.

Groundwater flow direction was observed to the west and northwest, toward Cape Charles Harbor.

2.2 Previous Phase II ESA

PBS&J completed a number of Phase II environmental site assessment activities on a portion of the STIP property during November and December 1997, and February 1999. Activities included the completion of 28 soil borings and associated soil sampling, installation and sampling of 5 groundwater monitoring wells, collection of 2 surface soil and surface water samples and completion of 21 test pit excavations. The Phase II investigation and associated soil/water sampling and analysis program were undertaken to determine the presence/absence of contamination in the vicinity of several areas of potential environmental concern.

Areas of solid waste dumping were identified, primarily in the area of the closed landfill. Several old appliances; abandoned automobiles; used tires; asphalt and concrete blocks; asbestos containing roofing materials; and miscellaneous wood, glass, metal and plastic materials were identified in the southeastern portion of the site. Similar materials were observed on areas of the adjacent Robberecht property.

Detectable concentrations of pesticides in surface and subsurface soils were identified at two locations on the subject property. Concentrations of DDT and related pesticide DDD were detected at 8 to 10 feet bgs in test pit P-9. Concentrations of aldrin, dieldrin, endosulfan, endrin and lindane were also detected in sample P-9. Based on their location and the lack of pesticides in other samples at the site, it is suspected that pesticides in this sample are related to past activities in the closed municipal landfill.

Aldrin, DDD, dieldrin, endrin and lindane also were detected in the soil sample collected at SS-1. Sample location SS-1 is located in a low-lying area containing standing or very slowly moving water, downgradient from the Robberecht property. Pesticides may

have been carried into this low-lying area by precipitation runoff and/or soil erosion from the closed landfill or the Robberecht property.

Concentrations of arsenic, copper, lead, mercury and zinc in the samples collected from SB-5 (0 - 2 feet bgs), SB-9 (6 - 8 feet bgs), P-9 (8 - 10 feet bgs) and SS-1 (0 - 1 feet bgs) were detected above the average background concentration for soil, but within the range of background concentrations for compounds in soil in the United States. Concentrations of cadmium, cobalt, iron and nickel were detected above average background concentrations in samples SS-1 and P-9. Total lead in soil was detected above average background in sample SS-2 (0 - 1 feet bgs).

The detected concentrations of cadmium, lead and zinc in the samples P-9 and SS-1 are all above the range of background concentrations for compounds in soil, as compiled by the USGS. Detected concentrations of iron in P-9 are above the range of background concentrations in soil. Sample P-9 was collected from a layer of soil/buried debris in the closed municipal landfill. Sample SB-5 was collected from the first two feet of soil, immediately downgradient of the landfill. Landfill debris was identified at the surface in the vicinity of SB-5. Sample SB-9 was collected from downgradient of the WWTP, former bulk oil facility and railroad track, near Cape Charles harbor. Surface soil sample SS-2 was collected in a wetland area near the unnamed stream.

Analytical results of metals and pesticides analysis from borings SB-2, SB-9, SB-10, and surface sample SS-2 compare favorably with the sample collected on the upgradient side of the site SB-12. For the most part, SB-5 also compares well with the results from SB-12. The samples from P-9 and SS-1 are more similar to each other than the other samples. This is believed to be a result of their proximity to the municipal landfill.

Leachable concentrations of several metals were detected in boring samples D-1 through D-8, which were installed in the February 1999 sampling event for the purpose of Toxicity Characteristic Leaching Procedure (TCLP) testing of landfill materials. No TCLP parameters were detected above regulatory levels for any of the samples.

No notable concentrations of VOCs, SVOCs, PCBs or cyanide were detected in any of the soil samples analyzed with the exception of several SVOCs in surface soil sample SS-1. Low concentrations of acenaphthylene (0.7 mg/kg), anthracene (0.8 mg/kg), benzo(a)anthracene (3.2 mg/kg), benzo(b)fluoranthene (3.8 mg/kg), benzo(k)fluoranthene (1.8 mg/kg), benzo(ghi)perlyene (1.2 mg/kg), benzo(a)pyrene (3.6 mg/kg), chrysene (2.7 mg/kg), fluoranthene (3.8 mg/kg), indeno(1,2,3-cd)pyrene (1.4 mg/kg), phenanthrene (3.1 mg/kg), and pyrene (5.4 mg/kg) were detected in SS-1. These compounds may have been carried into this low-lying area by precipitation runoff and/or soil erosion, or may be the result of dumping in the landfill area. Common sources of SVOCs also include roadway runoff and areas of vehicular traffic.

Groundwater and surface water samples were collected from the subject property, from five monitoring wells, a test pit excavation and at/near a small unnamed stream that traverses the subject property. Concentrations of total metals in groundwater such as aluminum, iron, lead appeared high; concentrations of certain total metals in groundwater vary widely across the site (i.e. aluminum, chromium, iron, lead, mercury and zinc). Particulates in groundwater apparently accounted for the bulk of total metals detected in samples. No dissolved priority pollutant metals, with the exception of low concentrations of zinc, were detected in any of the monitoring wells.

No concentrations of pesticides, VOCs, SVOCs, PCBs or cyanide above method detection limits were identified in any of the groundwater or surface water samples analyzed.

3.0 SAMPLING INVESTIGATION AND RESULTS

3.1 Landfill Gas

3.1.1 Procedures

On July 31, 2001, PBS&J arrived at the subject property to conduct landfill gas sampling probe installation. Eight sampling points (GP-1 through GP-8) at distributed intervals along the horizontal traverse of the landfill were determined and marked for placement of sampling probes. Sample locations are shown on Figure 4 and Figure 5 in Appendix A. Using a modification of the pilot probe procedure specified in EPA Method 25C, Section 2.1, a pilot probe was driven into the landfill surface at each sampling point by a front-end loader. The pilot probe consisted of a hollow stainless-steel tube with a PVC drive-point attached to the end. The probe penetrated at least 1.0 meter below the landfill cover for each probe location. A one-inch diameter PVC tube, with its bottom 1/3 perforated, was inserted into the hollow pilot probe and screwed into the drive point. The stainless-steel pilot probe was then removed from the ground, leaving the PVC sampling probe imbedded in the ground. The borehole around the sampling probe was sealed with bentonite. The top end of the probe was capped and fitted with a brass valve.

In order to ensure that landfill gas was being emitted from a sample probe location, the field sampling team screened each sampling probe location with an explosimeter. All eight sampling probe locations were tested and no landfill gas was detected at any of the probe locations. The sampling probes were left for 24 hours after installation before samples were collected.

PBS&J returned to the site on August 1, 2001, to conduct the landfill gas sampling. Passivated stainless steel canisters were used for sample collection. Each canister was under vacuum as received by the laboratory. The sampling train was assembled. The sample canister was attached and the sampling valve, flow control valve and tank valve was opened. Using the flow control valve, the team sampled at a flow rate of 100 ml/min

or less until either a constant flow rate could no longer be maintained because of reduced sample tank vacuum or the appropriate composite volume was attained. Each sampling tank was then disconnected and shipped to Triangle Environmental Services, Inc. laboratory for analysis.

PBS&J returned to the site on October 17, 2001, to conduct landfill gas sampling of four selected sampling probe locations. Sampling probe locations GP-4, GP-5, GP- 7 and GP-8 were selected for re-sampling. For each of the sampling points, the sampling train was assembled. A vacuum canister was connected to each sampling probe to purge each sampling probe. Each probe was purged for 20 minutes at a flow rate of 100 ml/min, to obtain a total volume of 2 Liters purged from each sampling probe. Once each probe was purged, a passivated stainless-steel sampling canister was attached to the probe and the sampling valve, flow control valve and tank valve was opened. The sampling team sampled at a flow rate of 100 ml/min or less until the sample cannister was filled. Each sampling tank was then shipped to the laboratory for analysis.

3.1.2 Results

Analytical results of landfill gas samples are summarized in Table 1 and in the analytical data sheets in Appendix B. Analytical results of the samples collected on August 1, 2001, revealed Nitrogen concentrations greater than 20 percent and Oxygen concentrations greater than 5 percent, indicating that ambient air may have been drawn into the landfill gas sample. Four of the probes having the highest methane concentrations from the August 1, 2001, sampling event were re-sampled on October 17, 2001. Landfill gas samples were collected from probes GP-4, GP-5, GP-7 and GP-8. On this date, the sampling probes were purged to remove ambient air from the sampling column prior to sampling. Analysis of these four samples by EPA Method 3-C revealed Nitrogen concentrations greater than 20 percent and Oxygen concentrations greater than 5 percent, indicating that the landfill is not likely producing gas. The sample from GP-4 also was submitted for analysis by EPA Method 25-C, even though this sample failed the Method 3-C quality control criteria. Analysis of the sample by EPA Method 25-C indicated non-

methane organic compounds (NMOC)at concentrations below detectable levels of the analytical method. At the request of EPA, the sample also was analyzed for carbon monoxide and hydrogen sulfide (EPA Method 16). Concentrations of both CO and H_2S were below the detectable levels of the analytical method for the sample collected from GP-4.

TABLE 1
Analytical Results of Landfill Gas Samples
Port of Cape Charles STIP

EPA Method 3-C - Summary of Results for Samples Collected August 1, 2001				
	Concentration (ppm)			
Sample ID	O_2	N_2	CH_4	CO_2
GP-1	91,037	786,730	<89	147,902
GP-2	201,141	804,424	<86	13,433
GP-3	198,012	805,035	<83	17,595
GP-4	88,337	830,411	11,848	87,336
GP-5	101,161	809,515	147	106,611
GP-6	78,153	804,390	<89	130,042
GP-7	52,336	813,338	29,218	118,737
GP-8	67,106	854,193	4,115	91,715

EPA Method 3-C - Summary of Results for Samples Collected October 17, 2001				
	Concentration (ppm)			
Sample ID	O_2	N_2	CH_4	CO_2
GP4B	24,565	859,709	149	142,441
GP5B	134,720	802,261	<82	92,535
GP7B	219,048	814,982	<89	491
GP8B	219,584	816,486	<88	490

EPA Method 25-C - Summary of Results for Samples Collected October 17, 2001						
	Concentrations (ppm)					
Sample ID	CO	CH_4	CO_2	NMOC	Mass Conc. (mg/cu.m)	H_2S
GP4B	<14	153	145,209	<35	<17	3.46 ND

ND = non detect; analytical result below the method detection limit

3.2 Soil Sampling

3.2.1 Procedures

Sediment sample SS-1, previously collected in an area of standing or slowly moving water near the Robberecht property, exhibited elevated concentrations of several metals, pesticides, and semivolatile organic compounds (SVOCs). To determine if contaminants had further migrated or were confined to the SS-1 location, three additional grab sediment samples were collected in the vicinity, at locations shown on Figure 4 as SED-1, SED-2 and SED-3. Samples were collected on July 19, 2001 following the same procedures as for SS-1. These procedures included use of a pre-cleaned stainless steel scoop at each location to collect surficial samples from a depth of less than one-foot. Each sample was placed directly into a pre-cleaned glass jar and sealed with no headspace or prior homogenization.

Samples were submitted to Air Water and Soil Laboratories, Inc. (AWS) for laboratory analysis of the following Target Analyte List (TAL) parameters: Pesticides by EPA Method 8081A; PCBs by EPA Method 8082; Total Metals; Volatile Organics by Method 8260B; and Semi-volatile Organics by Method 8270C.

3.2.2 Results

Analytical results of sediment sampling are summarized in Table 2 and in the analytical data sheets attached as Appendix B. Results showed low concentrations of the following pesticides: Aldrin; Dieldrin; 4,4 DDE; and 4,4 DDD, all below 0.15 part per million (ppm) and low concentrations of metals (lead at 260 ppm or below, arsenic at 17.1 or below, and several others at concentrations below the original SS-1 levels. No PCBs or volatile/semi volatile organics were detected. Results indicate that contaminants detected at location SS-1 do not appear to be widespread.

TABLE 2
Analytical Results of Sediment Samples
Port of Cape Charles STIP
November 1997 (SS-1) and July 2001
concentrations in mg/kg

Parameter	Sample Number				
	SS-1	SED-1	SED-2	SED-3	EPA SSL[1]
Pesticides					
alpha BHC	BDL	<0.02	<0.02	<0.02	0.1
gamma BHC (Lindane)	0.345	<0.02	<0.02	<0.02	0.5
beta BHC	BDL	<0.02	<0.02	<0.02	0.4
Heptachlor	BDL	<0.02	<0.02	<0.02	0.1
delta BHC	BDL	<0.04	<0.04	<0.04	NE
Aldrin	0.0127	<0.02	0.04	<0.02	0.04
Heptachlor epoxide	BDL	<0.40	<0.40	<0.40	0.07
Endosulfan I	BDL	<0.04	<0.04	<0.04	0.47
4,4 DDE	<0.0025	<0.04	0.09	0.05	0.2
Dieldren	0.117	<0.04	0.05	0.07	0.04
Endrin	0.009	<0.04	<0.04	<0.04	0.023
4,4 DDD	0.0764	<0.06	0.15	<0.06	0.3
Endosulfan II	BDL	<0.06	<0.06	<0.06	NE
4,4 DDT	BDL	<0.04	<0.04	<0.04	0.2
Endrin aldehyde	BDL	<0.08	<0.08	<0.08	NE
Endosulfan Sulfate	BDL	<0.02	<0.02	<0.02	NE
Methoxychlor	BDL	<0.40	<0.40	<0.40	0.39
Toxaphene	NA	<0.40	<0.40	<0.40	0.6

Chlordane	NA	<0.40	<0.40	<0.40	0.5
Metals					
Aluminum	5230	5230	5230	1490	NE
Antimony	BDL	BDL	BDL	BDL	31
Arsenic	15.3	7.1	17.1	5.9	0.4
Barium	429	146	298	148	5500
Beryllium	BDL	2.4	5.2	2.8	0.1
Cadmium	3.7	2.3	3.9	3.4	78
Calcium	7760	2950	3710	4790	NE
Chromium	34.3	9.6	9.9	3.0	3906
Cobalt	15.4	2.5	3.3	4.1	NE
Copper	190	46.7	94.3	43.4	NE
Iron	90,800	12,400	24,800	15,100	NE
Lead	864	111	260	68.2	400
Magnesium	808	856	494	374	NE
Manganese	328	53.4	141	170	NE
Mercury	0.45	0.083	0.165	0.046	23
Nickel	50.7	8.7	8.3	6.6	1600
Potassium	366	645	447	357	NE
Selenium	BDL	BDL	BDL	BDL	390
Silver	BDL	BDL	BDL	BDL	390
Sodium	277	53.7	55.2	50.2	NE
Thallium	BDL	<1.0	<1.0	<1.0	NE
Vanadium	13.1	11.6	7.4	3.6	550
Zinc	1360	129	238	152	23,000

BDL = below method detection limit
NA = not analyzed
[1]EPA SSL = Generic Soil Screening Levels for Superfund Sites, ingestion exposure pathway, from Soil screening Guidance: User's Guide April 1996 (EPA/540/R-96/018)

3.3 Asbestos Shingle Removal

3.3.1 Procedures

Asbestos containing transite shingle material was identified in the vicinity of test pit location P-16. The transite shingles were stacked in a shallow depression. On July31, 2001, PBS&J assisted the County of Northampton with location and removal of the transite material. A County backhoe operator excavated the shingles and adjacent soil and placed the debris into a County-supplied dump truck. Approximate total volume of excavated material was 10 cubic yards. County personnel then transported the debris to the Northampton County Municipal Landfill in Oyster, Virginia for disposal.

PBS&J provided a Virginia-licensed asbestos inspector/management planner to observe the excavation of the transite material. Based on visual inspection, the transite material was classified as a Category II Nonfriable Asbestos Containing Material (ACM) under the National Emission Standards for Hazardous Air pollutants (NESHAPS), 40 CFR Part 61 Subpart M. Under the NESHAPS definition, this transite debris is not classified as a regulated ACM because there was a low probability that the material would become "crumbled, pulverized, or reduced to powder during demolition." As a result, the material could be disposed as construction debris in a permitted landfill.

3.3.2 Confirmation Sampling

Soils around the transite excavation area were sampled for asbestos fibers following the excavation and disposal. The purpose of the sampling was to provide visual confirmation that ACM was removed from the location, and laboratory confirmation of asbestos fiber content remaining in the soils.

On October 17, 2001, PBS&J collected soil samples in the vicinity of the excavated transite material (vicinity of P-16). Four soil samples were collected from surficial soils (depth less than one-foot) from locations AB-1 through AB-4. Sample locations are

depicted on Figure 4 in Appendix B. Samples AB-1, AB-2, and AB-3 were collected within one to two feet of the excavation pit. Sample AB-4 was collected approximately 20 feet south of the excavation pit. All four sample were colleted from landfill soils, composed of sandy and silty material with broken glass, brick and wood debris.

Each sample was sealed in a plastic bag and submitted to Environmental Hazards Services, LLC, for analysis of bulk asbestos by Polarized Light Microscopy (PLM), EPA Method 600/R-93/116. Analysis identified Trace, <1% Chrysotile asbestos in each sample. Analytical results are summarized in Table 3 and in the analytical data sheets attached in Appendix B.

TABLE 3
Analytical Results of Soil Samples from Transite Shingle Excavation Area
Port of Cape Charles STIP
October 17, 2001

Paramater	Sample Location			
	AB-1	AB-2	AB-3	AB-4
Total Asbestos	<1% Chrysotile	<1% Chrysotile	<1% Chrysotile	<1% Chrysotile

4.0 SUMMARY

PBS&J completed additional site assessment activities at the former landfill (Town Dump) at Cape Charles STIP in response to a review and comment of the Phase II Environmental Site Assessment by EPA and ATSDR. The additional site assessment was limited to installation and sampling of eight landfill gas probes across the former active landfill area; collection of three additional sediment samples in the vicinity of sediment sample SS-1 to better determine the extent of pesticide, hydrocarbons, and metals contamination detected at this sample location during the Phase II ESA; and excavation and confirmation sampling related to non-friable asbestos containing shingle material identified in the landfill at Test Pit location TP-16.

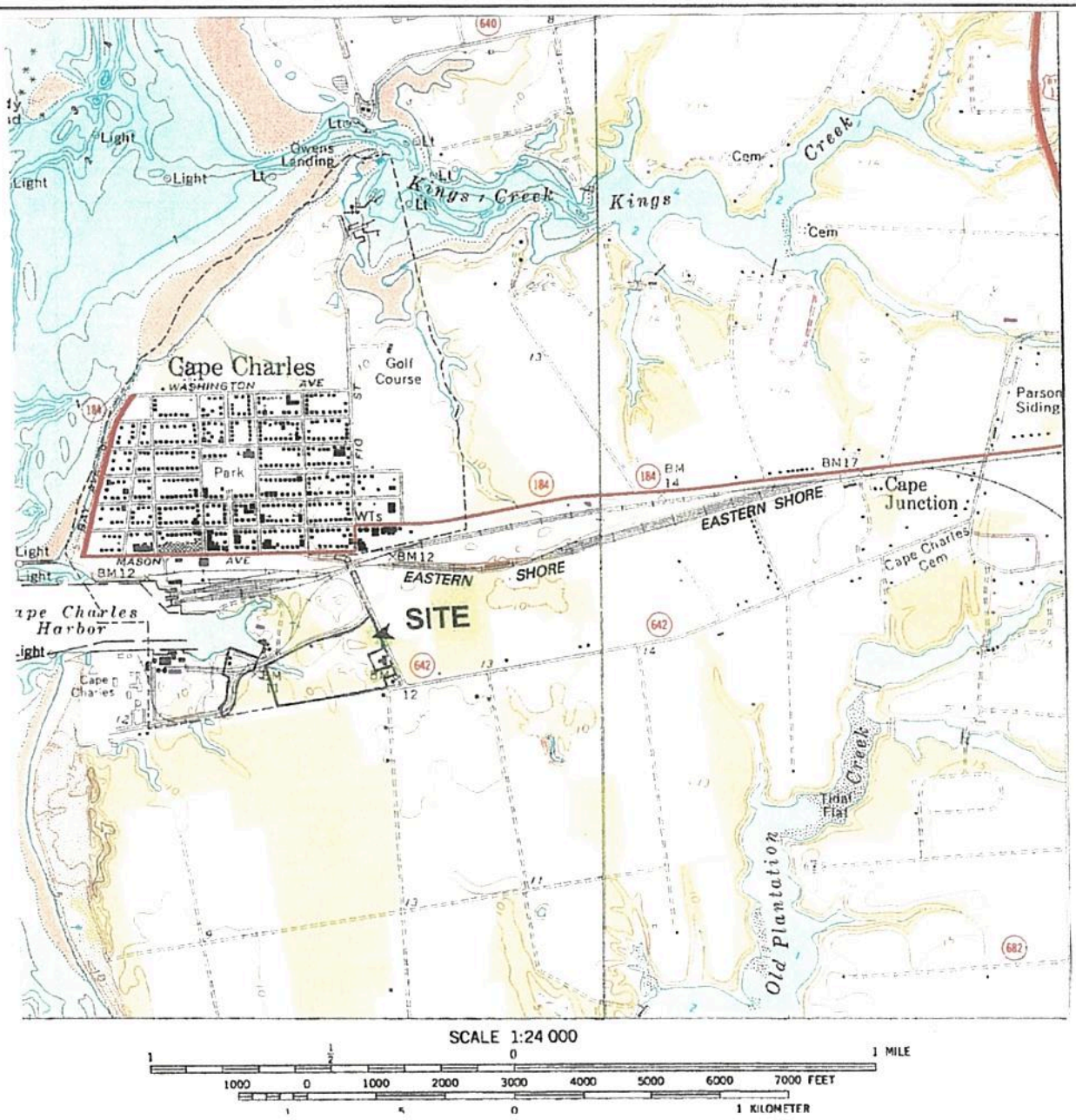
No evidence of active landfill decomposition gas generation was identified. Field readings at each of the eight sample probes with an explosimeter detected no gas emissions form the surface or from the probes. The initial round of passivated gas cannister sampling for all eight probes revealed a landfill gas concentration that as very similar to ambient air conditions. No methane concentrations above 3% total were observed; methane concentrations ranged from 147 ppm to 29,218 ppm (0.01% to 2.92%) in four of the probes, while the remaining four probes were below detection limits for methane. The four probes with detected methane were resampled to confirm results. To ensure that sample collection methods were representative of subsurface landfill conditions, the second round of samples were collected by actively purging the sample probes under a vacuum, rather that allowing passive entry into the sample canisters. The purpose of the purge technique was to more aggressively draw landfill gas into the probes and reduce the potential for entry of ambient air. Results of this second round also detected high oxygen and nitrogen concentrations, and very little evidence of decomposiiton gas. Of the four probes re-sampled, three had non-detectable methane concentrations; methane in the fourth sample probe tested, GP-4B was 149 ppm, or approximately 0.01%. Further analysis of sample GP-4B by Methods 25C and 16 revealed no detectable carbon monoxide (CO), hydrogen sulfide(H_2S), or non-methane organic compounds (NMOCs).

Results of additional sediment sampling in the vicinity of SS-1 revealed low concentrations of several pesticides and total metals that compared favorably with the original results of SS-1. No semi-volatile organic compounds were detected in the newly sampled areas. Results indicate that this low lying area may have been impacted from dumping on the landfill property or from offsite migration of contaminants from adjacent properties. Due to the low concentrations observed, active control measures or remediation do not appear necessary.

Asbestos-containing transite debris was successfully removed from the observed dumping area at location TP-16. Confirmation sampling of landfill soils in and around the location following removal revealed only a trace amount (<1%) of Chrysotile asbestos fibers in each of the four samples collected.

APPENDIX A

FIGURES



Cape Charles, VA/Cheriton, VA
37076-C1-TB-024/37075-C8-TF-024
Mapped 1968
Photorevised 1986

CONTOUR INTERVAL 10 FEET
DOTTED LINES REPRESENT 5-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

Mapped, edited and published by the U.S. Geological Survey

PBS&J

804 Moorefield Park Drive
Suite 302
Richmond, Virginia 23236

(804) 560-7600
Fax (804) 560-5129

FIGURE 1
SITE LOCATION MAP
CAPE CHARLES
SUSTAINABLE TECHNOLOGIES
INDUSTRIAL PARK
CAPE CHARLES, VIRGINIA

December, 2001